

Claims

[c1] 1. A system for managing medical diagnostic digital images, comprising:

a file server operable to store said digital images and an image directory for said digital images,

a database server operable to store an image record for each said digital image,

a user workstation having an input device and a display device, and operable with a graphical user interface, said user interface being coupled to said file server and to said database server, said user interface being operable to create an image copy of a user selected digital image from said file server, to display said image copy on said display device, to receive user selected image manipulations of said selected digital image from said input device, to display said image manipulations with said image copy on said display device, and to automatically add said image manipulations to said image record for said selected digital image as recorded manipulations.

[c2] 2. The system as set forth in Claim 1 wherein said user interface is operable to access said image record of said user selected digital image and to display with said im-

age copy said recorded manipulations from said image record.

- [c3] 3. The system as set forth in Claim 2 wherein said image manipulations are added as commands and said recorded manipulations from said image record are displayed by executing said commands.
- [c4] 4. The system as set forth in Claim 1 wherein said image manipulations are selected from the group consisting of move, zoom-in, zoom-out, rotate and contrast.
- [c5] 5. The system as set forth in Claim 4 wherein said user interface is operable to display a zoom-in box centered in said image copy in response to user selection of said zoom-in and to display a zoomed in image of said image copy center around a point in response to user selection of said point after said zoom box is displayed.
- [c6] 6. The system as set forth in Claim 4 wherein said user interface is operable to display a plurality of contrast controls with said image copy in response to user selection of said contrast manipulation, said contrast controls including a plurality of slider controls each representative of a grayscale range.
- [c7] 7. The system as set forth in Claim 1 wherein manipulations include annotations.

- [c8] 8. The system as set forth in Claim 7 wherein said annotations are selected from the group consisting of erase, text, pencil, highlight, point flag, measure and relative density.
- [c9] 9. The system as set forth in Claim 1 wherein said user interface is operable to display on said display device an application window, an image button palette and a tear-off tool bar, said image copy being displayed in said application window.
- [c10] 10. The system as set forth in Claim 9 wherein said tear-off tool bar is displayed at a user selectable location relative to said application window, said location being selected from inside said application window, outside and anchored to said application window, and outside and separate from said application window.
- [c11] 11. The system as set forth in Claim 10 wherein said tear-off tool bar includes twelve tool buttons with each said tool button corresponding to a said image manipulation.
- [c12] 12. The system as set forth in Claim 11 wherein said tool buttons include point flag, move, zoom in, zoom out, erase, text, ink, highlight, measure, contrast, orient, and image button palette on/off buttons.

- [c13] 13. The system as set forth in Claim 11 wherein said user interface is operable to display said tool buttons in any rectangular arrangement with rows and columns where the number of rows multiplied by the number of columns equals twelve.
- [c14] 14. The system as set forth in Claim 13 wherein said user interface is operable to display said tool buttons with similar functions in adjacent positions in each said arrangement.
- [c15] 15. The system as set forth in Claim 9 wherein said user interface is operable to display thumbnail images of all said digital images in a series where said series includes all digital images of a patient from a single date.
- [c16] 16. The system as set forth in Claim 9 wherein said user interface is operable to display a plurality of image layouts of said image copies of said digital images.
- [c17] 17. The system as set forth in Claim 1 wherein said user interface is operable to associate, in response to user input from said input device, a patient name with said user selected digital image and to add said patient name to said image record for said user selected digital image.
- [c18] 18. The system as set forth in Claim 1 including a re-

movable data storage media device in communication with said file server and operable to receive said digital images from said file server and archive said digital images on removable data storage media.

- [c19] 19. The system as set forth in Claim 18 wherein said file server is operable to store all unarchived digital images and said digital images that were most recently accessed by said user interface while reserving free file space for digital images, and to clear archived unused digital images.
- [c20] 20. The system as set forth in Claim 1 including a digital image capture device in communication with said file server and said database server, said capture device being operable to capture a digital image, transmit said digital image to said file server and to notify said database server of said digital image; wherein said file server is operable to automatically store said digital image and said database server is operable to create a said image record for said digital image in response to said notification.
- [c21] 21. The system as set forth in Claim 1 wherein said input device and said display device are combined into a touch-screen with user input selections being displayed as buttons on said display device.

[c22] 22. A system for managing medical diagnostic digital images, comprising:

- a digital image capture device operable to capture digital images;
- a file server operable to store said digital images and an image directory for said digital images, said file server being in communication with said capture device and operable to receive and automatically store said digital images from said capture device;
- a database server operable to store an image record for each said digital image, wherein said database server is in communication with said capture device and is configured to receive notification of said digital images from said capture device and to create a said image record for each said digital image in response to said notification;
- a user workstation having a touch-screen input and display device, and operable with a graphical user interface, wherein said user interface is coupled to said file server and to said database server, said user interface is operable to create an image copy of a user selected digital image from said file server, to display said image copy on said input and display device, to receive user selected image manipulations of said selected digital image from said input and display device, to display said image manipulations with said image copy on said input and dis-

play device, to automatically add said image manipulations to said image record for said selected digital image as recorded manipulations, to access said image record of said selected digital image, and to display said image copy with said user selected said recorded manipulations from said image record; wherein available said manipulations include move, zoom, rotate, contrast, and annotations; available said annotations include erase, text, pencil, highlight, point flag, measure and relative density; said user interface is configured to associate, in response to user input from said input device, a patient name with said selected digital image and to add said patient name to said image record for said selected digital image; and

a removable data storage media device in communication with said file server and operable to receive digital images from said file server and archive said digital images on removable data storage media, wherein said file server is operable to store all unarchived said digital images and said digital images that were most recently accessed by said user interface while reserving free file space for said digital images and to clear archived unused said digital images.

[c23] 23. A method for managing medical diagnostic digital images, comprising the steps of:

providing a file server;
storing a plurality of said digital images in said file server;
providing a database server;
storing an image record in said database server for each said digital image;
providing a user workstation having an input device and a display device;
receiving a selection of a selected digital image from said input device;
displaying said selected digital image on said display device;
receiving a user command for an image manipulation of said selected digital image from said input device;
displaying said image manipulation with said selected digital image on said display device; and
adding said image manipulation to said image record for said selected digital image as a recorded manipulation.

[c24] 24. The method as set forth in Claim 23 including the step of displaying said recorded manipulation with said selected digital image on said display device.

[c25] 25. The method as set forth in Claim 24 wherein said image manipulation is added to said image record as said user command and said recorded manipulations are displayed by executing said user command.

- [c26] 26. The method as set forth in Claim 23 wherein said image manipulation is selected from move, zoom, rotate, contrast and annotations.
- [c27] 27. The method as set forth in Claim 26 wherein said annotations are selected from erase, text, pencil, highlight, point flag, measure and relative density.
- [c28] 28. The method as set forth in Claim 23 including the steps of:
receiving a patient name from said input device; and
adding said patient name to said image record for said selected image.
- [c29] 29. The method as set forth in Claim 23 including the steps of:
providing a digital image capture device;
capturing a digital image with said capture device;
storing said digital image on said file server; and
creating an image record for said digital image on said database server.
- [c30] 30. The method as set forth in Claim 23 including the step of archiving said digital images to removable data storage media.
- [c31] 31. The method as set forth in Claim 30 including the

steps of:

maintaining all unarchived said digital images and said digital images that were most recently accessed on said file server while reserving free file space on said file server for new said digital images; and
clearing archived, unused said digital images from said file server.

[c32] 32. A method for managing medical diagnostic digital images, comprising the steps of:
providing a digital image capture device;
providing a file server;
providing a database server;
providing a user workstation having an input device and a display device;
capturing digital images with said capture device;
storing said digital images on said file server in response to said step of capturing;
creating an image record for each said digital image on said database server in response to said step of capturing;
receiving a selection of a selected digital image from said input device;
displaying said selected digital image on said display device;
receiving a patient name from said input device;

adding said patient name to said image record for said selected digital image;

receiving a user command for an image manipulation of said selected digital image from said input device, wherein said image manipulation is selected from a plurality of available input manipulations including move, zoom, rotate, contrast, and annotation; and said annotation is selected from erase, text, pencil, highlight, point flag, measure and relative density;

displaying said image manipulation with said selected digital image on said display device;

adding said user command to said image record for said selected digital image as a recorded manipulation;

executing said user command to display said recorded manipulation with said selected digital image on said display device;

archiving said digital images to removable data storage media;

maintaining all unarchived said digital images and said digital images that were most recently accessed on said file server while reserving free file space on said file server for new said digital images; and

clearing archived, unused said digital images from said file server.

[c33] 33. Software stored on computer storage media for

managing medical diagnostic digital images, comprising: a set of computer instructions for receiving a selection of a selected digital image from an input device, displaying said selected digital image on a display device, receiving image manipulations of said selected digital image from said input device, displaying said image manipulations with said selected digital image on said display device, and adding said image manipulations to an image record for said selected digital image on a database server as recorded manipulations.

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34. The software as set forth in Claim 33 wherein said image manipulations are selected from move, zoom, rotate, contrast and annotations.

[c35] 35. The software as set forth in Claim 34 wherein said annotations are selected from erase, text, pencil, highlight, point flag, measure and relative density.

[c36] 36. The software as set forth in Claim 33 wherein said set of instructions includes instructions for displaying said recorded manipulations with said selected digital image on said display device.

[c37] 37. The software as set forth in Claim 33 wherein said set of instructions includes instructions for receiving a

patient name from said input device and adding said patient name to said image record for said selected image.

- [c38] 38. The software as set forth in Claim 33 wherein said set of instructions includes instructions for displaying said recorded manipulations with said selected digital image on said display device.
- [c39] 39. The software as set forth in Claim 33 wherein said set of instructions includes instructions for adding said image manipulations as commands and for executing said commands to display said recorded manipulations with said selected digital image on said display device.